Board of Forestry and Fire Protection

Monitoring Study Group Meeting

May 18, 2016

South Lake County Fire Protection District Station
Middletown

and

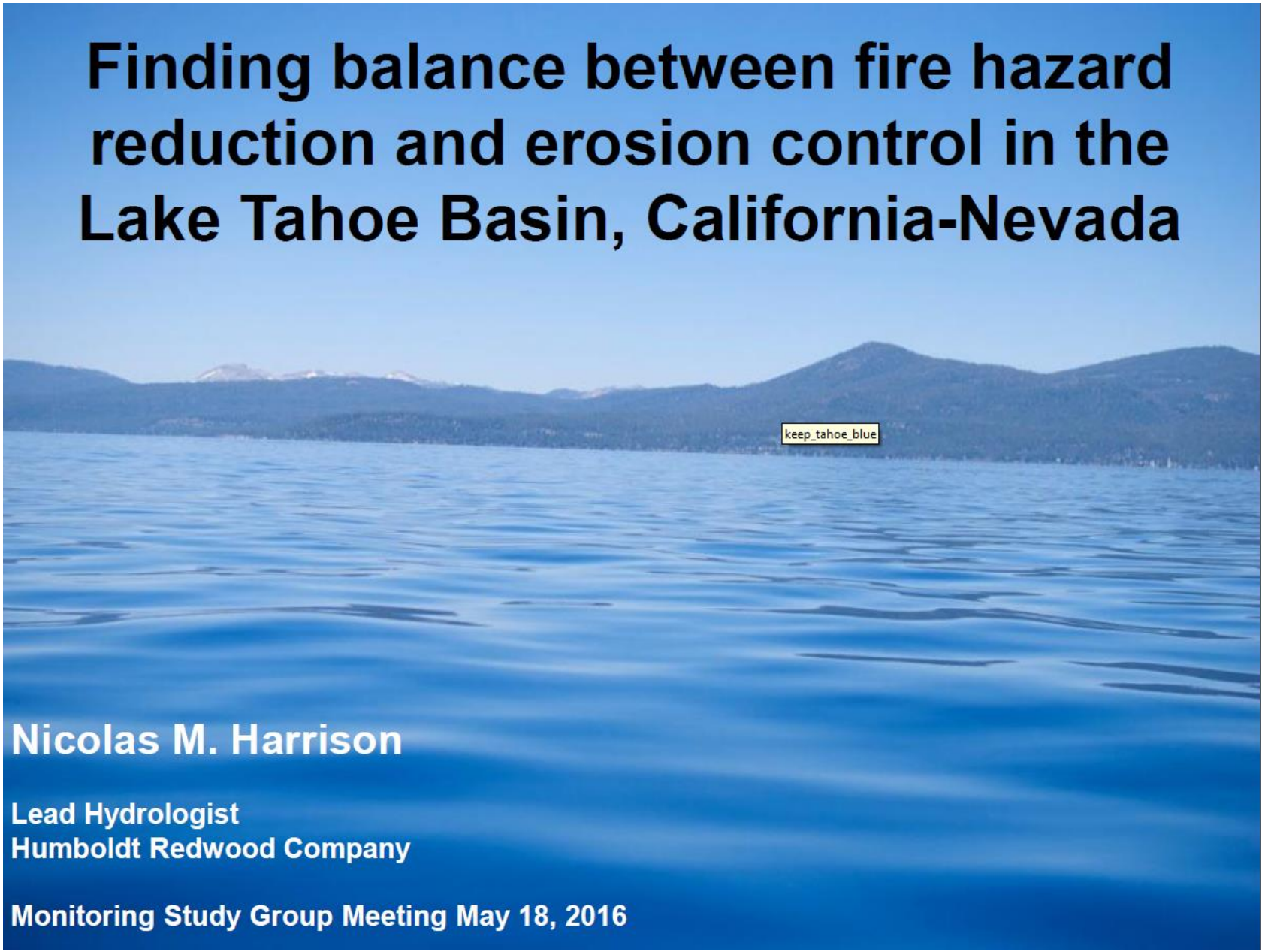
Boggs Mountain Demonstration State Forest
Cobb

Agenda

1. Lake Tahoe Basin Fuels Treatment Study
2. Brief Updates on MSG Cooperative Instream Monitoring Projects
3. Brief Updates on BOF EMC and AB 1492 Efforts
4. Field Presentation on the Post-Fire Erosion Studies Underway at BMDSF

41 people in attendance

Finding balance between fire hazard reduction and erosion control in the Lake Tahoe Basin, California-Nevada



Nicolas M. Harrison

Lead Hydrologist
Humboldt Redwood Company

Monitoring Study Group Meeting May 18, 2016

Complete PowerPoint posted on the MSG website

Reduced fuel loading a higher priority after the 2007 Angora Fire

Prescribed fire: broadcast burns

presribed_fire_EK

Photo: E. Knapp

nps.gov

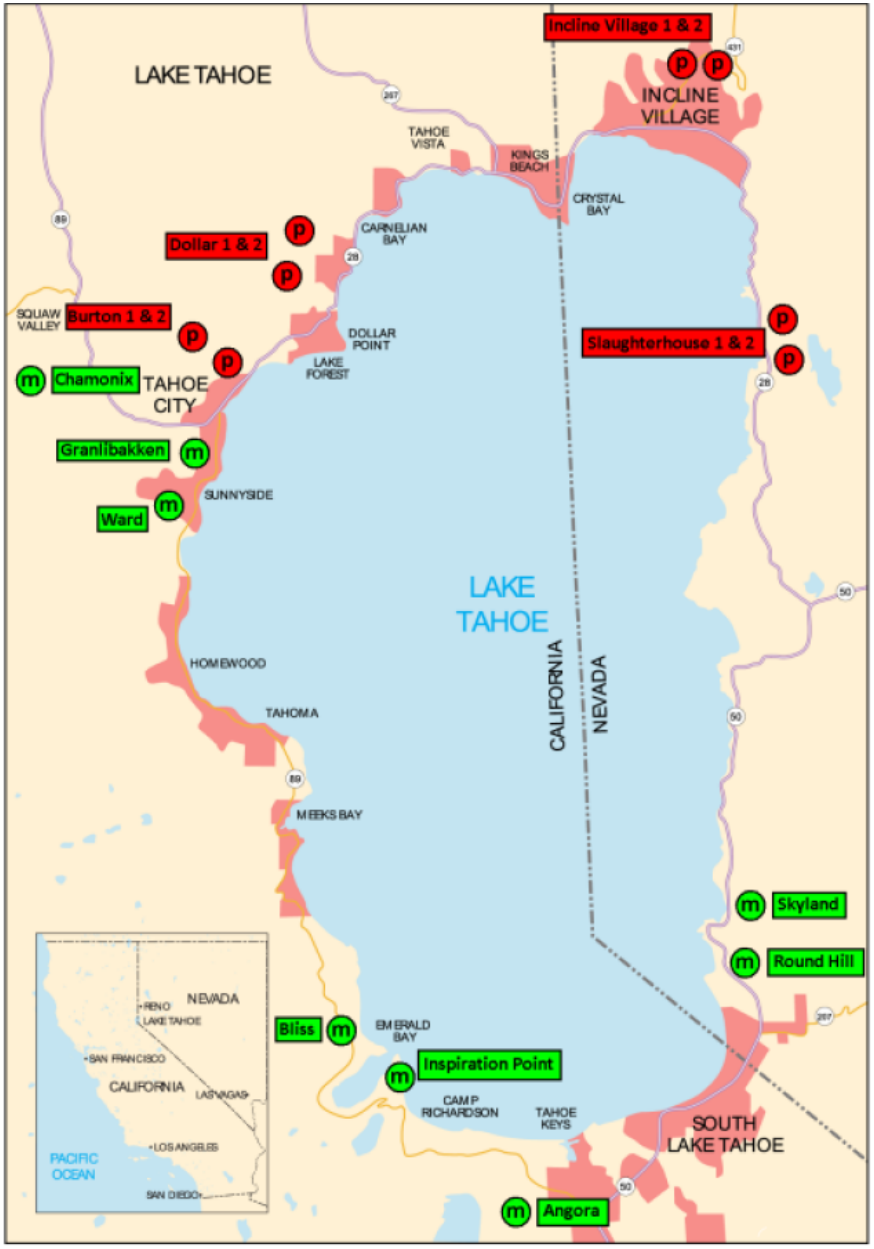
Mechanical mastication

Study Goals and Objectives

- **Study Objective**: Quantify tradeoffs between fuel reduction and erosion

- **Critical Question**: What are optimal levels of surface fuel retention for mechanical mastication and prescribed fire treatments?

Plots for determining erosion from different treatments were 5 m x 2 m
Snowmelt runoff was simulated with a runoff simulator



Experimental Design

Snowmelt runoff simulation

- 8 masticated sites (2009)
- 8 prescribed fire sites (2010)
- Slopes: 15-38%
- Soil types: Granitic (n = 7)
  Volcanic (n = 9)

Masticated sites: 9 plots/site (5 “patchy” retention, 4 “even”); Rx fire sites: 6 plots/site

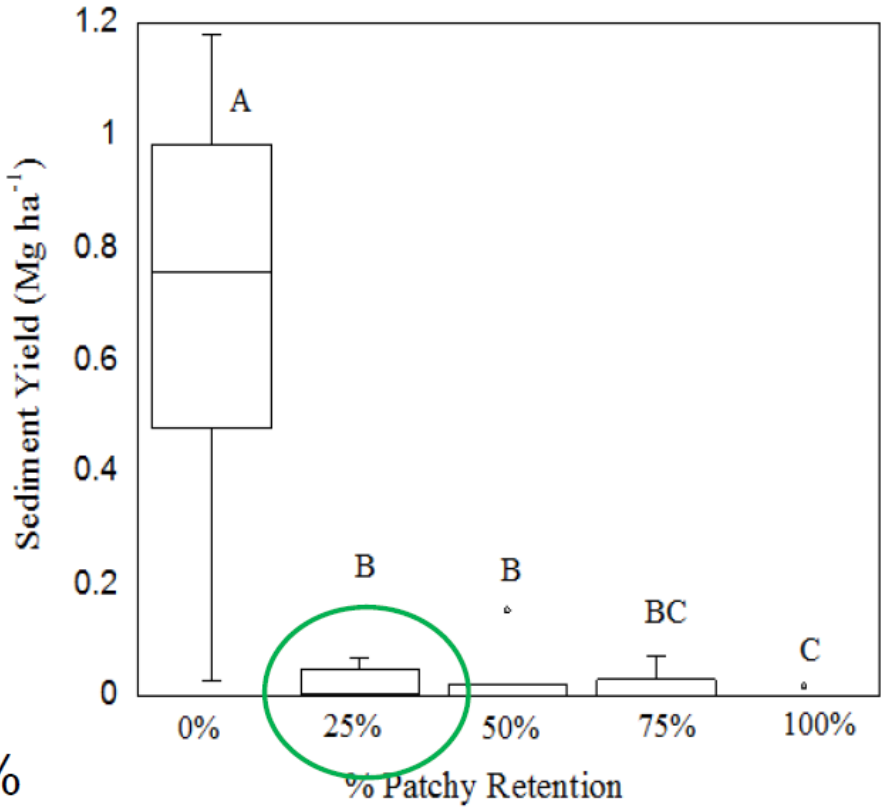
“Patchy” retention plots had retention rates of 0%, 25%, 50%, 75%, and 100%

“Even” retention plots had retention rates of 25%, 50%, 75%, and 100%

Rx fire treatment plots had fuel consumption of ~ 0-25%, 25-50%, 50-75%, and 75-100%

Results: Masticated Sites: Patchy Retention Treatments

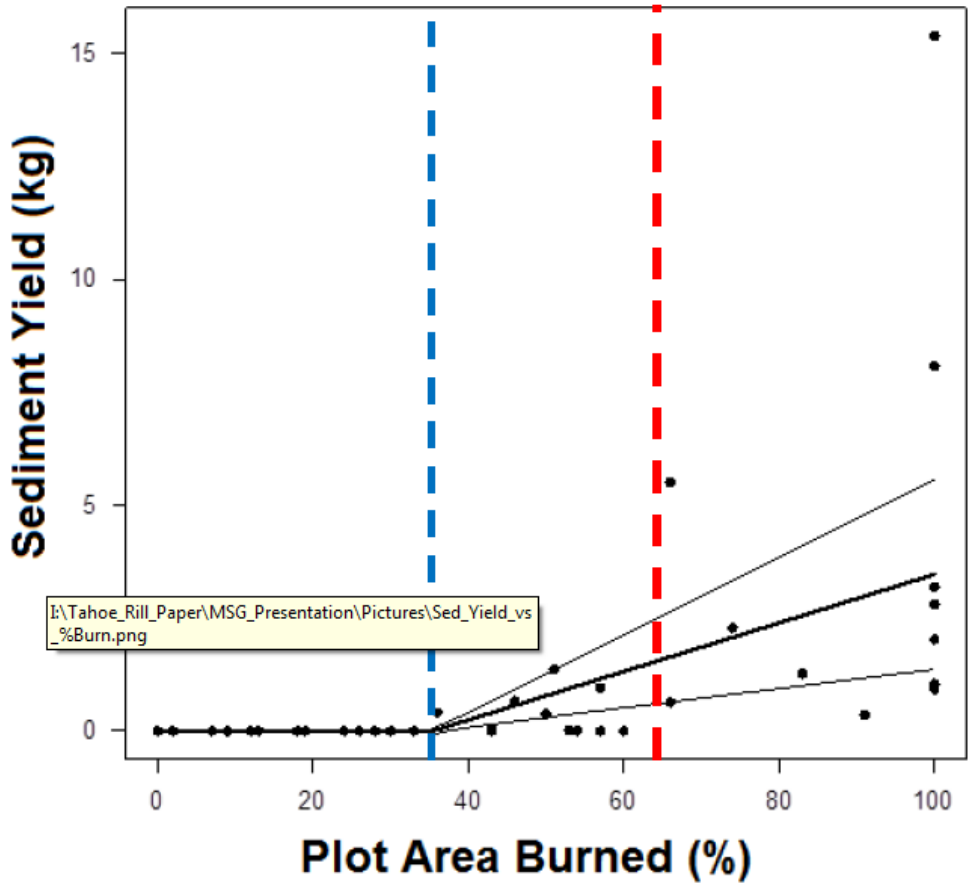
- Bare soil exposure resulted in highest avg. sediment yields
- Similar sediment yields in 25% and 50% treatments but both were 97% lower relative to 0% treatments
- No significant difference between sediment yields measured in 75% and 100% treatments



Sites with patchy retention treatments had lower sediment yields than even treatments

Results: Prescribed Fire Sites

- Minimal to no sediment yields at < 35% burn severity
- Variable sediment yields at 35% - 66% burn severity
- High sediment yields at >65% burn severity



Results consistent with earlier research conducted in the Tahoe Basin

Conclusion

- Erosion and wildfire severity can be simultaneously mitigated through the use of:
  - Masticated fuel reduction treatments or prescribed fire treatments that leave sufficient organic matter to trap sediment, and
  - Have sufficiently low fuel loading and/or enough fuel discontinuity or patchiness to limit fire spread.

MS thesis is available online and the published paper is available from Nick Harrison

MSG Cooperative Instream Monitoring Projects

- ***Caspar Creek*** *Watershed Study—Dr. Salli Dymond, USFS PSW*
- ***Little Creek*** *(Swanton Pacific Ranch)—Dr. Brian Dietterick, Cal Poly State University*
- ***Railroad Gulch*** *BMP Evaluation Study Update—Nick Harrison, HRC*
- ***South Fork Wages Creek*** *Cooperative Instream Monitoring Project—Pete Cafferata, CAL FIRE*
- ***Little River*** *(Humboldt County)—Dr. Lee MacDonald, CSU, and Matt House, GDRCo*
- ***Judd Creek*** *Cooperative Instream Monitoring Project—Dr. Cajun James, SPI*

Post-Fire Runoff and Erosion Studies at BMDSF

Gerri Finn, BMDSF Forest Manager (retired)

Jim Wright, CAL FIRE Division Chief

~30 million board feet logged to date

Drew Coe, CAL FIRE Monitoring Program Coordinator, at Catchment #1, low burn severity

Post-Fire Erosion Studies at BMDSF

Drew Coe, Don Lindsay, Dr. Joe Wagenbrenner

3 Main Study Components

- **Catchment Study (6 swales ranging from 0.4 to 1.6 ac)**
  - quantify the effects of different soil burn severities on catchment scale runoff rates, sediment delivery, etc.

- **Post-Fire Forest Management Study**
  - **5 treatments and controls replicated in 5 blocks**

- **Post-Fire Demonstration Study**
  - demonstrate alternative BMPs for post-fire salvage operations

Catchment-Scale Channel #6, a moderately burned swale

Electronic tape used to measure flow through the v-notch weir

Post-Fire Erosion Studies at BMDSF

Plot-Scale Experiment Treatments

- Salvage logged with ground-based methods following practices in larger sale units (i.e., logged only).
- Logged and contour subsoiled (ripped).
- Logged and pre-emergent herbicide site preparation.
- Logged and delayed application of defoliant herbicide site preparation.
- Logged, ripped, and pre-emergent herbicide (space dependent).

Control Plot 15 m x 5 m

Sediment measurement at a plot-scale sediment fence


CAL FIRE
CAL FIRE

Post-Fire Erosion Studies at BMDSF

- Funding for this study is being pursued through the State Water Resources Control Board's 319(h) non-point source funding program.

- EMC Project No. 2016-002.
- Project Description:

http://www.bof.fire.ca.gov/board_committees/effectiveness_monitoring_committee_/pdfs/emc_5.1_draft_concept_proposal_emc-2016-002_04__14_16.pdf